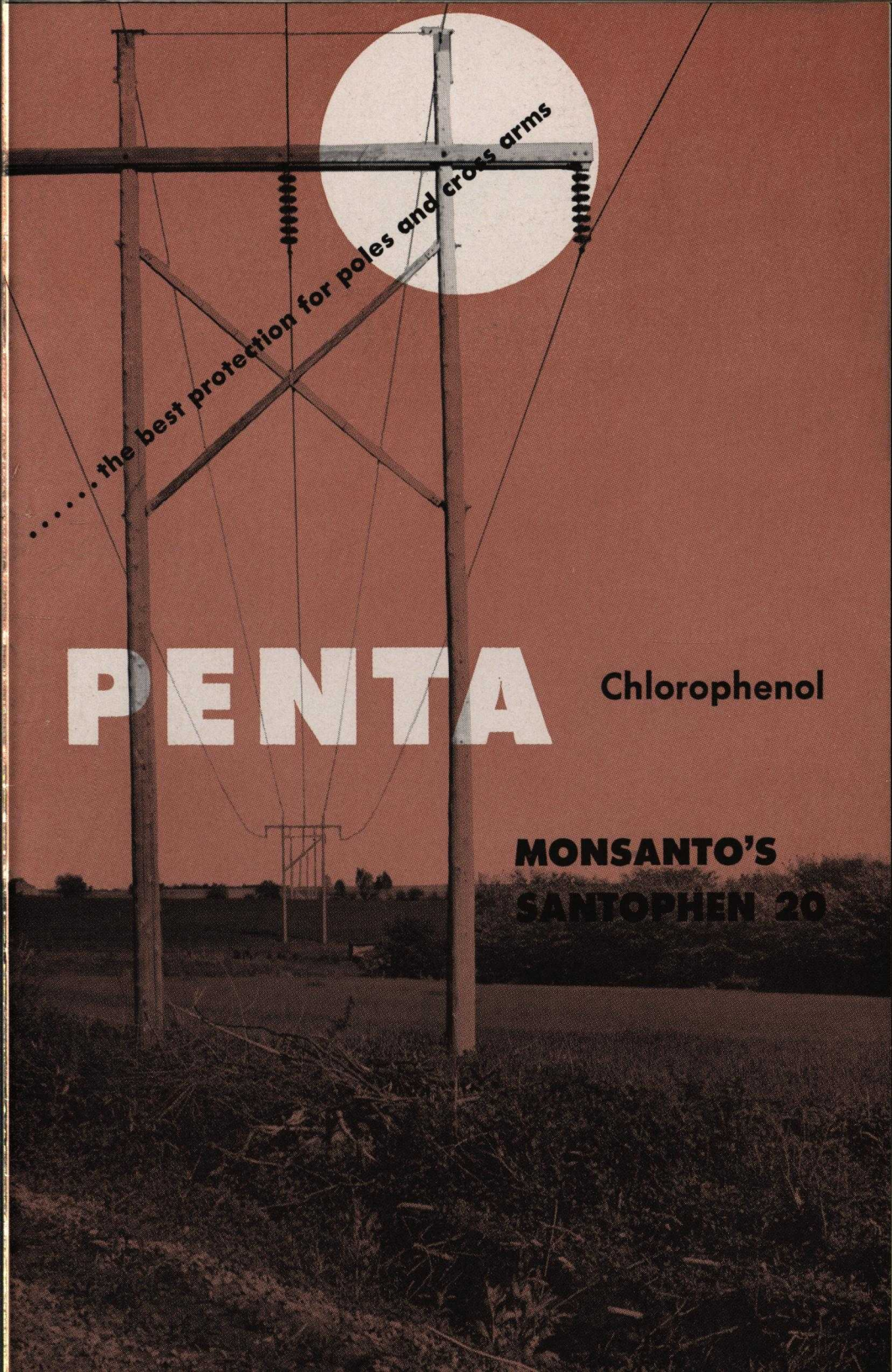
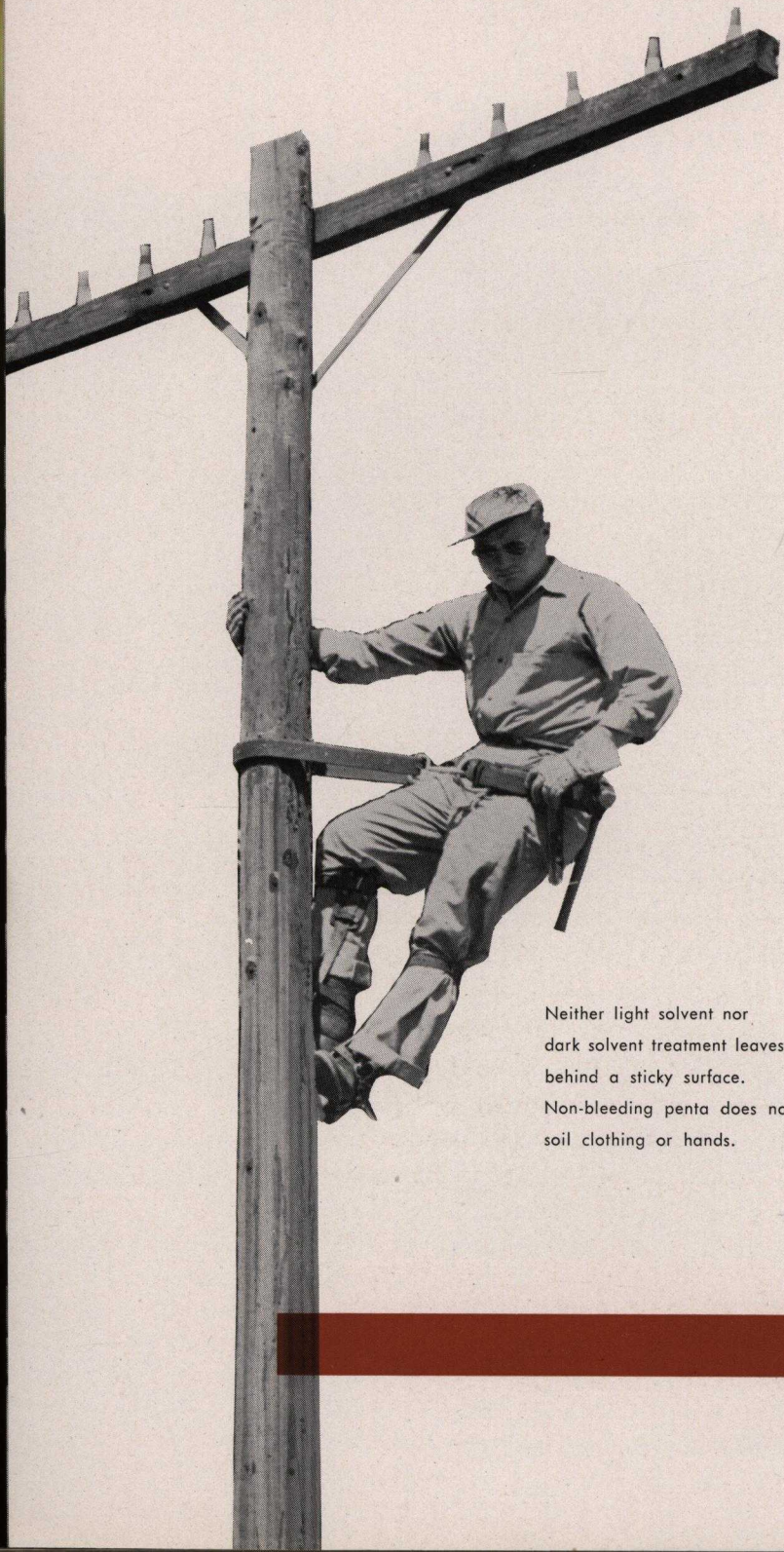

. . . . . the best protection for poles and cross arms
PENTA
Chlorophenol
MONSANTO'S
SANTOPHEN 20

**PENTA is short for pentachlorophenol technical, Monsanto's Santophen 20**

Field tests recently completed show that Santophen 20 is one of the most powerful wood preservatives in commercial use. Properly treated penta-protected wood is resistant to wood rot, termites, and wood boring insects. Performance tests in "stake graveyards" show that penta provides excellent below ground protection against decay. And penta protection is long-lasting; a properly treated pole will far outlast the normal expected service life in the line. Such extensive service is possible even under continuous exposure to the most difficult climatic conditions. This booklet explains the advantages of Santophen 20, Monsanto's penta, for poles and cross arms.



Neither light solvent nor dark solvent treatment leaves behind a sticky surface. Non-bleeding penta does not soil clothing or hands.

# Why PENTA is the best preservative

**PENTA treated poles are clean!**

Poles and cross arms treated with penta are clean and non-bleeding. Penta is a dry, flaky grayish powder. It is impregnated into the wood as a 5% solution in oil, a clean oil treatment which produces a dry, non-tacky surface. Penta does not bleed from the wood, causing stickiness and staining. Treated poles are virtually unchanged in appearance when *light colored* solvents are used. If a *dark colored* solvent is used, poles are a rich black in appearance, not "coated" or "sticky", but completely dry and clean. Light treatment is favored in some areas; in other areas, a dark treatment is preferred.

Penta cannot "rub off" to stain linesmen's clothing or hands. Penta treated poles have virtually no odor; cross arms may be stored indoors without giving off strong, chemical odors or soiling warehouse floors.

## PENTA Treated Wood Does Not Cause Skin Irritation

Santophen 20 treated poles are not a source of skin irritations. Penta treated wood is neither a primary irritant nor a skin sensitizer. Frequent contact with the hands will not cause a dermatitis. Poles are dry to the touch and safe to handle and climb. "Burning" of linesmen's hands, face, and body is eliminated with non-bleeding penta treatment. Poles are easy to set and safer to service; penta treatment saves lost time and eliminates chemical hazards to linesmen.

## Long Lasting Protection

Poles and cross arms treated with penta are immune to attack by termites, rot, and wood borers over long periods of time. Penta penetrates the wood, makes poles and cross arms toxic to the prime destroyers of wood; fungi decay, boring insects and termites.

Penta is a non-volatile compound. At 122°F, Monsanto's Santophen 20 has a vapor pressure of only 0.002 mm mercury. This non-volatility is a user's assurance that penta will not dry out, or evaporate away, leaving poles unprotected.

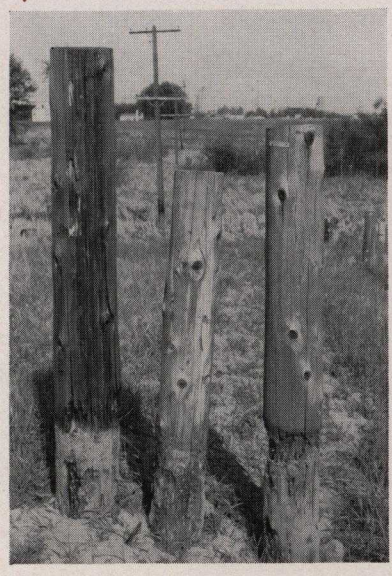
Penta is virtually insoluble in water. At 122°F, a gallon of water will dissolve only 0.003 lbs. of Santophen 20. Neither ground moisture nor service in wet, humid regions will cause the penta to leach out of the wood. Frost, dew, moisture in shaded areas near the

In the Laboratory and in the field, Penta is death to wood destroyers.

Under scientifically controlled rot-promoting conditions, penta-treated wood resists decay.

And field tests support laboratory data. These three cedar test stubs contain 1.4, 5.4 and 2.8 lbs. of 5% penta-in-oil per cubic foot. After seven years, they have not the slightest trace of deterioration.

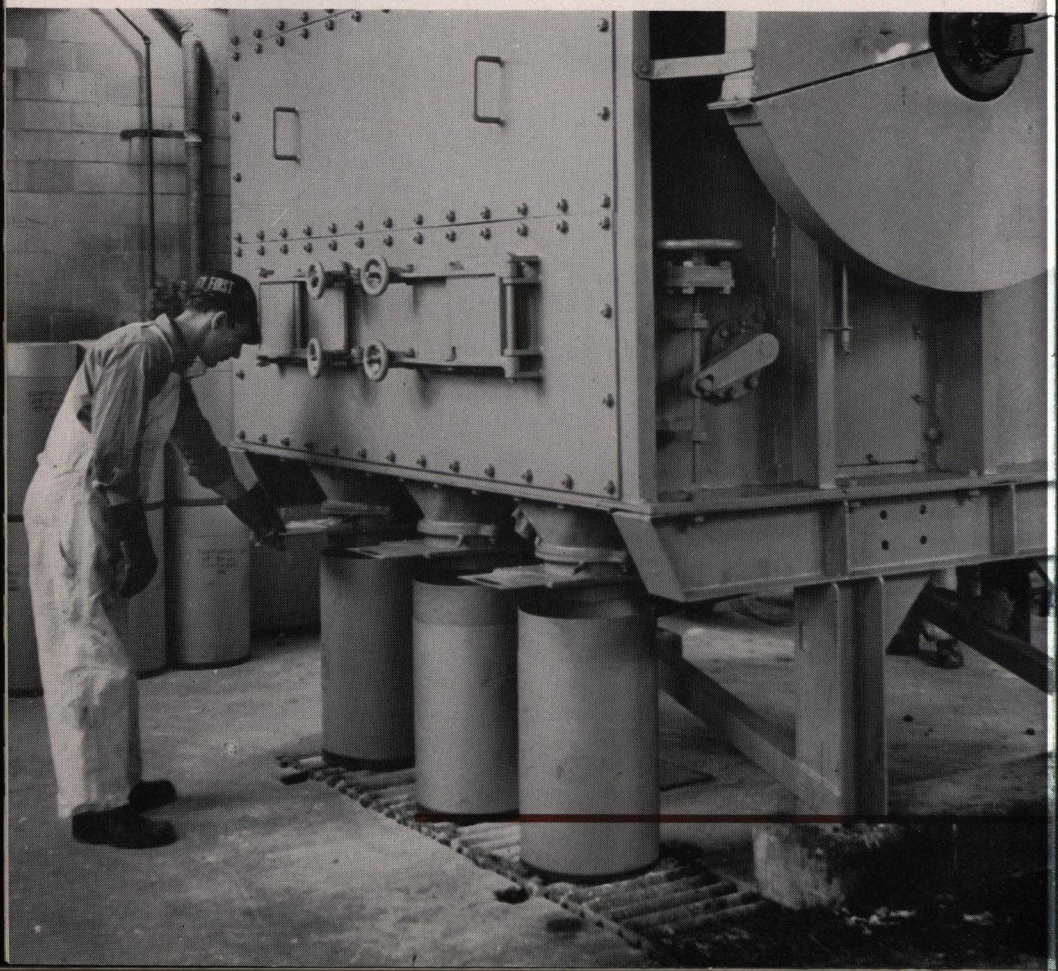
Identical cedar stubs under same conditions but without penta protection. All badly decayed after SIX YEARS.



ground have virtually no effect on insoluble penta deep in the wood cells. Rain, melting snow, ground water will not "wash out" the preservative.

# PENTA is a uniform chemical compound

Monsanto's Santophen 20 (pentachlorophenol, technical) is supplied at a specified purity and is dependably uniform. PENTA is not a by-product, but a standard compound produced within rigid specifications. It possesses a definite chemical constitution.

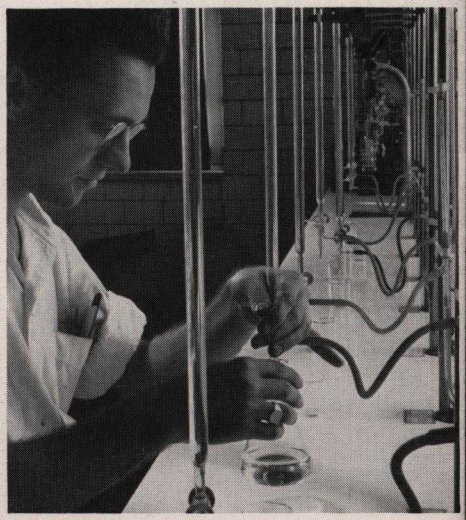


## Percent of PENTA in Wood Can Be Checked

PENTA protection can be checked by chemical analysis. If the wood treating process uses a dark colored solvent, borings can be examined visually for depth of penetration. A quantitative analysis can be made for the amount of penta present in the wood. Such data are an actual check on the amount of retention of the preservative as reported by the treating plant.

Purchasers of treated poles can obtain definite analytical data on the amount of preservative present in the wood, valuable information for maintaining a control on the efficiency of treatment. Monsanto will send on request a complete procedure for "*The Determination of Santophen 20 in Wood By Lime-ignition Method.*"

Penta is a definite chemical entity, produced under closely regulated conditions and strictly controlled.



Both the distribution and quantity of penta present in the wood can be determined by a quantitative analysis.

## PENTA Protection Assists Reduction of Power Loss

Rotted areas on poles, rendered more porous by decay, retain water in the loosened fibers. Damp poles are notably better conductors than dry wood and frequently account for measurable power losses. Penta prevents the formation of decayed, porous areas which retain high moisture and foster power leakage.

## PENTA Does Not Increase Flammability

Monsanto's penta, Santophen 20, is a non-flammable compound. Chemically it is a stable linkup of chlorine and phenol. Santophen 20 cannot be ignited by the application of ordinary flame. Poles treated and properly dried are no more combustible than ordinary wood.

Although penta is impregnated in poles as a 5% (by weight) solution in low cost oils or distillates, within a period of days the more volatile portion of the liquid solvent evaporates, usually before poles are shipped. Penta treatment, therefore, is a dispersion of a non-flammable compound distributed uniformly in the vulnerable sapwood of the pole. In event of short circuits, the ignition tendency of penta-treated poles is no greater than untreated wood. Non-flammable, non-volatile penta permits inside storage of treated cross-arms, stakes, and bracing, without pungent fume and fire hazard.

# How poles are treated with PENTA

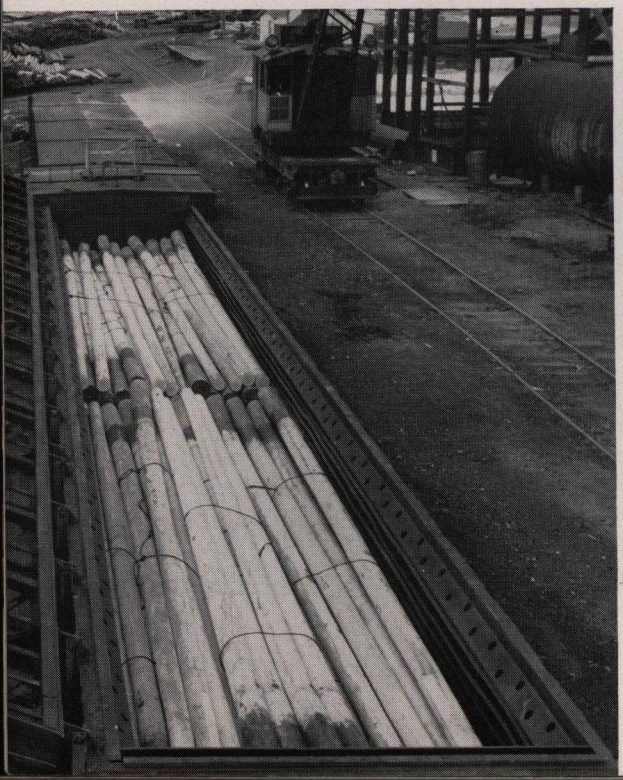
Poles are preserved with Santophen 20 by the application of commercial wood treating methods. Any type of commercial treatment is satisfactory that as-

Santophen 20, Monsanto penta, can be forced into the wood by pressure treatment . . .

sures the deep, uniform penetration of penta into the wood and adequate retention.

The general types of treating methods most commonly used for poles are pressure treating and hot and cold open tank methods. The pentachlorophenol is impregnated in the seasoned poles as a 5% (by weight) solution in oil. After treating, poles are ready for shipment, completely clean and dry. Proper treatment is highly important to assure long lasting protection.

Cross-arms are similarly treated. Where other methods are impractical, open tank treating will add materially to the service life of cross arms. (For small scale dip treatment, write Monsanto for descriptive folder.)



. . . or distributed through the sapwood by hot and cold dip treatment..

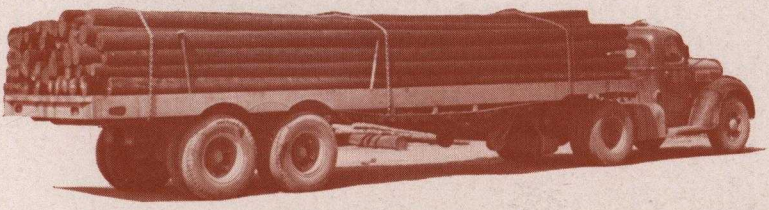
Each pole is stamped to indicate a certified treatment . . .

Penta has no effect on "texture" of wood. Proper treating insures against "case hardening."

## PENTA Does Not Harden Wood

Properly treated with penta, poles have the appearance and feel of untreated wood. Because penta treatment takes advantage of the excellent penetrating properties of petroleum solvents, *milder treating methods can be used.* The reduced temperatures possible with penta treatment can eliminate the "case hardening" that frequently results from the high temperatures required for application of less penetrating preservatives.

. . . and shipped CLEAN, ready for long service.



# How much PENTA to specify

There are a number of specification terminologies, each depending upon the particular method of treatment and the species of wood. The most common practices are to specify the amount of retention per total cubic foot of wood treated (pressure treating); or the depth of penetration and/or amount of retention in sapwood alone (non-pressure treating). The specification to be stipulated will depend on the method of treating and the terminology used by the supplier.

Penta is one of the most effective wood preservatives in commercial use. Poles and cross arms treated with penta in accordance with recognized standards are fully protected against rot, termites, Lyctus "Powder Post" Beetle, and other boring insects. Penta is outstandingly effective below ground.

**Penta Treatment Costs less because of Extra years in service.**

## Specify Santophen 20 Treatment

**Minimum Standards for Pressure Treatment**

(Pounds of 5% Santophen 20-in-oil solution Per Cubic Foot of Wood)

| | In Arid Regions | High Moisture Areas | Tropical Service |
|---|---|---|---|
| Poles | 6 lbs. | 8 lbs. | 12 lbs. |
| Butts | 6 lbs. | 8 lbs. | 12 lbs. |
| Cross Arms | 6 lbs. | 6 lbs. | 8 lbs. |

**Penta Treated Poles and Cross Arms Are:**

**CLEAN**

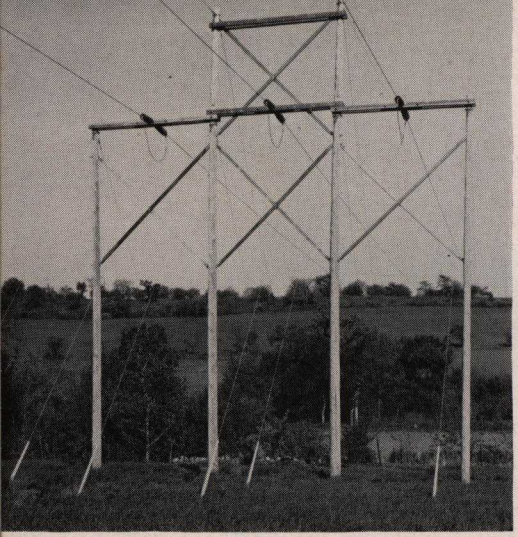
**SAFER TO SERVICE**

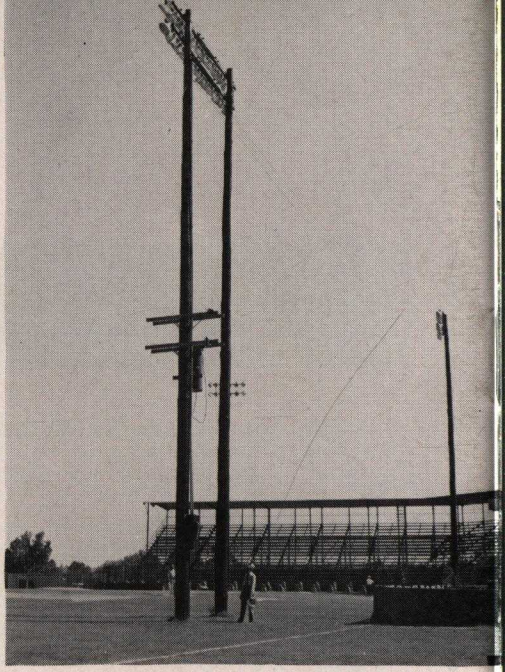
**EASIER TO HANDLE AND STORE**

For information on suppliers of Santophen 20 treated poles, butts, crossarms, and construction lumber, call or write Monsanto.

# Specify PENTA,

**Monsanto Santophen 20**





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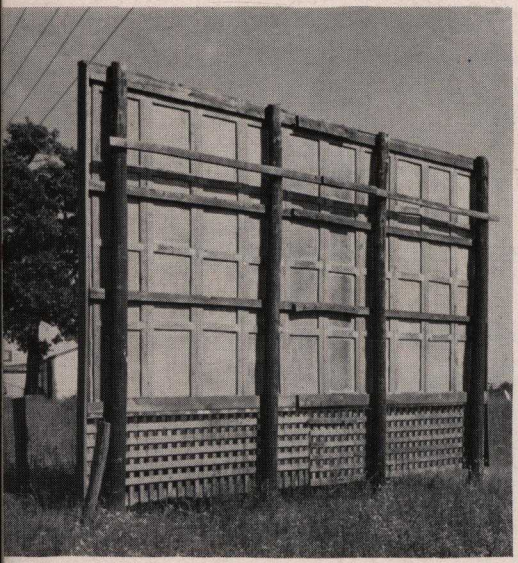

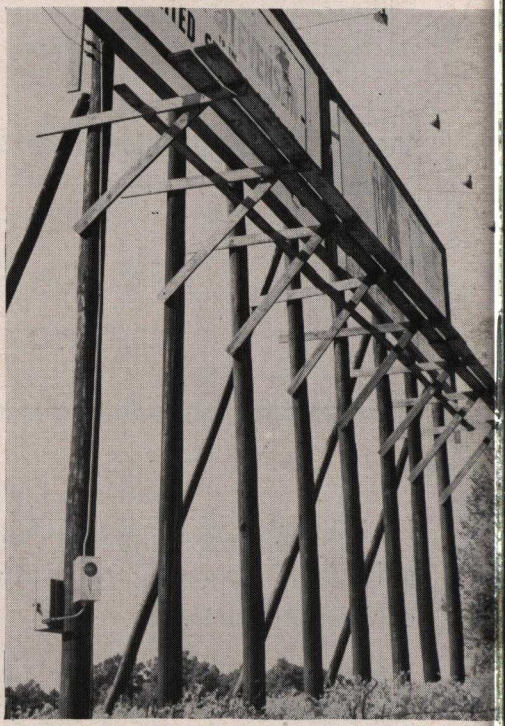

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Furthermore, nothing contained herein shall be construed as a recommendation to use Penta in conflict with existing patents covering any material or its use.

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